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ABSTRACT

The research discussed in this speech was undertaken to demonstrate the relationship between the per pupil expenditure and the community attributes of education, occupation, and income in New York State and the relationship between community attributes and tax rate. In addition, analyses of tax rate and expenditure level were undertaken. The remainder of the paper discusses previous findings regarding the relationships of school district property wealth, income, tax rate, and expenditure level; explains the present study; and discusses the findings. Finally, the article examines the results compared with previous studies, and suggests avenues for further research. (Author/MLF)

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THE RELATIONSHIP OF EXPENDITURE LEVEL
AND TAX RATE TO SCHOOL DISTRICT INCOME,
'OCCUPATION, AND EDUCATION

by

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A Paper Presented at the
American Educational Research Association
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1. Introduction

The earliest justification for state aid to community public schools was the inability of some school districts to maintain a certain standard of educational quality with local taxation. Expenditures and tax rate disparities were so pronounced by 1919 that a study of the seven richest and seven poorest towns in Connecticut revealed that the wealthiest enjoyed per pupil expenditures of \$24.65 for a tax rate of 2.76 mills, compared to a per pupil expenditure of \$20.87 at a tax rate of 4.37 mills for the poorest (Cubberly, 1919). Despite seventy years of elaboration to state funding plans, there still remains a persistent pattern of property wealth and expenditure linkage. In 1975, averaged over all states, low wealth districts spent 90 percent in per pupil expenditures to 111 percent per pupil for high wealth districts (Brown, et al. 1979).

The relationship of property wealth and expenditure per pupil, with accompanying high tax rates for low expenditure districts, has been deplored since Coons, et al. first raised the issue that resulted in Serrano (437 P2d 1241 (1971)). Challenges to funding systems permitting this relationship in state courts, legislatures wishing to respond to judicial scrutiny, and citizens desiring tax relief have caused some twenty-five states to revise their state funding formulas for elementary and secondary education (Odden, 1978).

However, arguments arose that a more refined measure of the fiscal capability of a school district would include income. These arguments were based upon the notion that property values and wealth are not always highly correlated, and that agriculturally or industrially rich school districts may have a low income, and, therefore, a low fiscal capacity (Odden, 1976). Alexander (1978) found little relationship between income and property wealth in California. Overall, income was thought to be the best single explanatory variable for government expenditures (Sharkansky and Hofferbert, 1969).

Interest in income measures has been enhanced by the enactment of income taxes as a revenue source for school districts. Maryland, Kansas, and Iowa all permit income taxes to be used directly or indirectly by school districts as revenue (Odden, 1976). Connecticut and Rhode Island are using a combined income-property-wealth measure to adjust their state-aid formula. California, Illinois, Michigan, Nebraska, Ohio and Wisconsin are considering similar measures.

But studying the relationship between property wealth and income does not indicate the relationship between per pupil expenditures and income. The question raised by correcting property wealth for income must be whether income affects per pupil expenditures. If so, then an income correction is desirable in measuring school district fiscal capacity.

In addition, since property wealth and tax rate are typically inversely related, another proper question is the relationship between income and tax rate, and tax rate and expenditure level. Some proponents of school finance reform have argued that Serrano was not, in fact, a case about equity to groups of children, but rather equity to taxpayers (Benson, 1978). Goertz (1978) has shown that finance reform in New Jersey resulted in property-poor school districts lowering their tax rates, rather than increasing per pupil expenditures, maintaining and even widening the existing per pupil expenditure disparity between property rich and property poor school districts.

The recent search for a cost of education index to adjust the price that school districts must pay for equivalent educational services also revolves about whether income should be treated as a supply or demand feature of a school district. Typically, income is included as an explanatory variable estimating teachers' and administrators' salaries, with the assumption that income affects per pupil expenditures (Chambers, 1978).

This work was undertaken to demonstrate the relationship between the per pupil expenditure and community attributes of education, occupation and income in New York State and the relationship between community attributes and tax

rate. In addition, analyses of tax rate and expenditure level were undertaken.

The remainder of the paper discusses previous findings regarding the relationships of school district property wealth, income, tax rate, and expenditure level, explains the extant study, and discusses the findings. Finally, the article examines the results vis-a-vis previous works, and suggests avenues for further research.

2. Previous Studies

As early as 1968, researchers had identified a positive linear relationship between the median family income of a school district and its tax effort. (Johns and Kimbrough). Indeed, Gensemer claimed that in Ohio, each additional one hundred dollars in 1969 median family income was related to a .14 millage increase in the tax rate. Further, income was the best predictor of tax rate. (Gensemer, 1976). In 1978, Hickrod studied the 1973 school finance reform impact in Illinois. He found, prior to the reform, that per capita income, the percentage of college graduates resident in the school district, and the percentage of employed managerial and professional residents all were positively related to the educational tax rate (Betas of .448, .329, and .498 respectively). (Hickrod, et al., 1978) However, only income retained this relationship after the reform. Further, using ANOVAs with tax rate change as the criterion variable, with equalized assessed valuation and median family income as the two main factors, he found that the largest increases in tax rate were in districts of high wealth and medium and high income. After the reform, the largest increases in tax rate were in high wealth, low income districts. Yang and Chaudhari (1976) also found that Illinois districts with high income, high occupational status, and high education attainment tax highly.

Although there may be strong evidence for a relationship between median income and tax rate, the same does not hold for the correlation between property wealth per pupil and income per pupil or household income, at least in many states. Cox (1976) asserts that there is no relationship between school district property wealth and family income. Yang and Chaudhari (1976) found similar results for Illinois, while Hansen and Nelson (1979) found no consistent relationship in Wisconsin. Several reasons have been advanced for the absence of a positive relationship: Cox asserts that the extreme variation in California school district wealth (\$78 assessed value/pupil to \$1,088,434) and limited variation in average

family income (\$6,068 to \$73,530) is responsible. Augenblick (1979) advances the notion that property value typically is a mixture of commercial, industrial, agricultural and residential property. Income and residential property are positively correlated, but the other types of property are not because of the existence of poor families in those non-residential property areas. Work directly relating education and occupation to school district property value is virtually nonexistent. However, the work of Yang and Chaudhari (1976) demonstrated a high correspondence between property values and tax rate, so that high property value districts might also be expected to have a high income, high occupational status, and high educational attainment. In opposition to this indirect evidence is Firestine (1977) who found equalized property value per pupil virtually unrelated to a variety of factor components measuring socioeconomic status.

The third area of interest is the relationship between expenditure per pupil and income, education, occupation, and property wealth. Feldstein (1975) has demonstrated a .475 correlation between per pupil expenditures and median family income, and a .283 correlation between equalized property value per child (expressed as natural logarithms). Ladd (1975) simultaneously found that expenditures per pupil increased as income increased, with elasticities of .41 to .46. For property wealth, the percentage change ranged from .24 to .29. Grubb and Michelson (1974) found income and expenditure per pupil correlated at .82, and property wealth and expenditure at .40. The only variable that has not been shown to be related to expenditure per pupil is education, although such a variable is almost always a factor in a principal components analysis utilized by Firestine (1977) and Sparkman (1977). For example, in Sparkman's analysis, median years of schooling completed by the population age 25 and older had a positive loading of .88 on Factor 1, "Education/Income." Factor 1 was then demonstrated to explain high state effort for education.

To recapitulate, a school district's educational tax rate has been found to be positively related to the district's median family income, percentage of resident

college graduates, and percentage of professional residents. The per pupil expenditure of a district has been shown to be related to median family income and equalized property value. However, the relationship between expenditure level, district educational level, and district occupational level is uncertain. There is apparently no relationship between property wealth and income, or at least a mixture of residential and non-residential property wealth and income. The author was unable to locate extant work on the relationship of education and occupation to property wealth.

3. Data Collection

All data was supplied by the New York State Department of Education on a data tape. The file was composed of the 1975-76 Consolidated Data Base and the 1975-76 Finance Tapes for all 705 school districts in the state. A complete list of variables is included in Appendix A and was associated with an earlier study (Fowler and Furno, 1978). Variables of interest in this study were: school district per pupil expenditures; 1975 property wealth divided by the 1975-76 resident weighted average daily attendance; the tax rate for educational purposes.

The data file supplied by the New York State Education Department was then merged with 1970 Census data for New York school districts obtained from the U.S. Bureau of Census 5th Count data tape. Using a methodology devised by Charles Nam in 1963, the median education, occupation, and income of each district was transformed into a continuous scale from 0 to 100 for each measure (Working Paper No. 15, 1963). Matches were obtained for 642 districts (of 705). Since 1963, Nam (et al., 1975) have been engaged in an ongoing study of the dynamics of occupational status stability and change. Occupational status scores, income, and education scores that were appropriate for the 1970 Census were used. Nam (1975) comments upon the methodology for occupations, which was similarly applied to education and income.

For each of the categories, the procedures for deriving the scores are essentially the same, being based on the combined average levels of education and income for incumbents of the occupation. More specifically, the procedure involved (a) arraying occupations according to the median educational level of persons in the experienced civilian labor force, (b) arraying the occupations separately according to the median income level of each occupation, (c) by using the number of persons engaged in each occupation as weights, determining the cumulative interval of persons in each occupation for each of the two arrays, and (d) averaging the midpoints of the two cumulative distributions of occupants and dividing by the experienced civilian labor force to get a status score for the occupation. The resulting scores can take values between 0 and 100, and a score

indicates the approximate percentage of persons in the experienced civilian labor force who are in occupations having combined average levels of education and income below that for the given occupation.

Nam completed a major re-classification of the occupational list in 1970 to increase the homogeneity of the detailed occupations and to reduce the number of persons listed under occupations not classified elsewhere. Examination of the scores between censuses demonstrates little change for the vast majority of occupations, although notable changes occurred for a small group of occupations.

4. Data Analysis

The computer program, Statistical Package for the Social Sciences (Nie, et al., 1975) was utilized to obtain means, frequencies, and skewness of the variables of interest. Variables displaying positive skewness in excess of 1.00 were transformed into natural logarithms, reducing the abnormality of the distribution. Per pupil expenditure levels (ranging before transformation from \$800 to \$4,000) were treated in this manner, as was property wealth.

Two distinct strategies were employed in analyzing the relationships of interest. First, scattergrams were produced to display the relationship between school district per pupil expenditure level and school district education, occupation, and income, as expressed by the Nam scale. The same procedure was employed for tax rate. This was designed to reveal zero-order correlation in an easily displayed form indicating abnormalities in the relationship, significance level, and the coefficient of determination.

In addition, expenditure level and tax rate were separately regressed on school district per pupil property wealth. These regressions provided metric weights that were used in an equation to estimate the residual of expenditure level and tax rate controlling for property wealth. Scattergrams were then produced to display the relation of district education, occupation, and income scales on per pupil expenditure level and tax rate with property wealth controlled.

The computation of the metric weights was obtained by regressing the variable to be controlled against the variable of interest. The predicted value of the variable of interest was then computed using formula 1.1:

$$(1.1) \text{ Est } 1 = \text{constant} + (b + \text{controlled variable})$$

The residual of the variable of interest was obtained by subtracting this estimate from the actual value of the variable, using formula 1.2:

$$(1.2) \text{ Res } 1 = (\text{Variable of interest} - \text{Est } 1)$$

Scattergrams were then plotted against Res 1, which display the correlations with the effects of the controlled variable removed.

Briefly, it is useful to mention descriptive data concerning the variables of interest. District expenditure level per child, before natural log transformation, had a mean of 1579.32, a standard deviation of 466.28, a minimum value of 834.88 and a maximum of 4393.64. The wide range is reflected in the high positive skewness of the distribution, 2.03. Property wealth per child (actually 1975 Full Value per 1975-76 RWADA) demonstrated a mean of 54,683, with a standard deviation of 47,968.99, a minimum of 10,456.09, a maximum of 458,991.56, and a positive skewness of 4.182.

The true tax rate for educational purposes (which had 6 missing observations, reducing the n to 699 from 705) possessed a mean of 17.62, a standard deviation of 5.44, a minimum of 6.46 and a maximum of 34.24. However, its skewness was below 1.00, (.58) and so it was not transformed.

Education, Occupation and Income, having been transformed into 0-100 scales, all had 642 valid observations. Education had a mean of 57.18, a standard deviation of 6.35, a minimum of 33.75 and a maximum of 80.58, and was skewed in a positive direction at .69. Occupation possessed the highest mean, 73.92, with a standard deviation of 7.30, a minimum of 49.97, a maximum of 92.82, and was barely skewed at .165. The mean of income was 50.16, with a standard deviation of 5.63, a minimum of 35.16, a maximum of 67.79, and a positive skewness of .70.

5. Results

Table 1 displays the zero correlation coefficients obtained from scattergrams of property wealth, per pupil expenditure level, and tax rate for educational purposes, plotted against the school district's scores on education, occupation, and income. Education, occupation, and income were all highly correlated with expenditure level, tax rate, and property wealth. Surprisingly, tax rate and property wealth showed no relationship ($.02960$ n.s. $R^2 = .00088$), while tax rate and expenditure yielded a correlation of $.43 < .01$ $R^2 = .19$.

When education, occupation, and income were plotted against property wealth, the income measure obtained the highest correlation ($.39$), and explained roughly 16 percent of the variance. Education and Occupation were virtually identical, correlated at $.29$ and $.29$, respectively, and having R^2 of $.08$.

Plotting the same four scales against the log of school district per pupil, expenditure resulted in income showing the highest relationship ($.60$), with 35 percent of the variance, occupation a close second, with a $.56$ correlation and 31 percent of the variance, and education the lowest, with a correlation of $.44$ and explaining 20 percent of the variance.

The scattergrams for tax rate yielded yet a third pattern. Occupation obtained the highest correlation ($.60$), with an R^2 of 35 percent, while income demonstrated only a $.55$ correlation, with an R^2 of $.30$. Education was lowest with a $.45$ correlation, and an R^2 of $.20$.

Figures 1-11 (See Appendix B) display the scattergrams that resulted from plotting the zero-order correlations of expenditure level per child, tax rate for education, and property wealth per child against the district's income, occupation, and education scales. One advantage of scattergrams is the visual display to indicate abnormalities, outliers, or nonlinearity in a relationship. For example, where the two cases that appear in Figure 1 (at 7.06-7.23, at 33.75) between 8.22 and 8.06 (at 33.75), one could be highly suspicious of the obtained results.

TABLE 1
Results of Zero-Order
Correlation Scattergrams

Dependent Variable: Log of School District Property Wealth Per Child

<u>Independent Variables</u>	<u>Correlation</u>	<u>Significance</u>	<u>Coefficient of Determination</u>
Education Scale:	.29110	.001	.08474
Occupation Scale:	.28756	.001	.08269
Income Scale:	.39491	.001	.15595
Tax Rate:	.02960	n.s.	.00088

Dependent Variable: Log of School District Per Pupil Expenditure

Education Scale:	.44637	.001	.19925
Occupation Scale:	.55989	.001	.31348
Income Scale:	.59976	.001	.35971
Tax Rate:	.43470	.001	.18897
Property Wealth:			

Dependent Variable: School District Tax Rate for Education

Education Scale:	.45270	.001	.20494
Occupation Scale:	.59278	.001	.35139
Income Scale:	.55123	.001	.30385

n=642

Figure 4 contains just such an example. Displaying the relationship between the tax rate and per pupil expenditures, the quadrant (8.39-7.89; 6.46-16.18) at the upper left contains 9 of 699, or 1.3 percent of all scores. However, the pattern of their scatter may cause the relationship to be distorted. Eliminating these points from the analysis changes the correlation coefficient from a .43 to a .50.

Table 2 demonstrates the results of the scattergrams of per pupil expenditure and tax rate against education, occupation, and income with property wealth controlled. The first effect is to substantially reduce the correlations obtained between the dependent and independent variables. Although the occupation and per pupil expenditure correlation is lessened by only .05, income drops by .15, and education by .11. The R^2 of each variable is also correspondingly reduced. Interestingly, the relative explanatory power of the variables changes, so that income had the highest correlation with per pupil expenditure, occupation next, and education last. However, holding property wealth constant causes occupation to have the highest correlation, income next, and education last.

The relative rankings of occupation, income, and education remain the same when correlated with the district tax rate for education, although those correlations show the same reductions in strength as were previously demonstrated with per pupil expenditure. Occupation (.53), income (.50) and education (.45) are all about .05 lower than previously obtained values.

Figures 12-19 (See Appendix C) are the scattergrams illustrating the relationships obtained in Table 2. For the astute reader who pauses to consider the negative signs found on the y axis of Figures 12-19, remember that the scattergrams are of the residuals of expenditure level and tax rate, with the effects of property wealth removed (see Section 4). The large residuals displayed in Figures 16-19 are the result of the virtually nonexistent relationship between tax rate and property wealth. (See Table 2.)

TABLE 2

Results of Scattergrams Controlling
for
Property Wealth

Dependent Variable: Log of School District Per Pupil Expenditure

<u>Independent Variables</u>	<u>Correlation</u>	<u>Significance</u>	<u>Coefficient of Determination</u>
Education	.34	.01	.12
Occupation	.52	.01	.27
Income	.45	.01	.20
Tax Rate	.62	.01	.39

Dependent Variable: School District Tax Rate for Education

Education	.41	.01	.18
Occupation	.53	.01	.28
Income	.50	.01	.25

n=642

Table 3 contains the results of the regression runs used to obtain the metric weights used in the equations to estimate the residuals of expenditure level and tax rate controlling for property wealth. Property wealth determines 56 percent of the variation in per pupil expenditure levels with an F ratio of 900.73526, significant at .001. However, tax rate and property wealth yielded an R^2 of .00088, and an F ratio of .611 (n.s.).

TABLE 3

Regression of Per Pupil Property Wealth on the
Log of Expenditure Level and Tax Rate

Dependent Variable: Log of Per Pupil Expenditure Level

Independent Variables	Multiple R	R^2	Simple R	b	Beta	DF	F
Property Wealth	.74943	.56165	.74943	.3262710	.74943	1 703	900.73526

Dependent Variable: Tax Rate

Property Wealth	.02960	.00088	.02960	.2786130	.02960	1 697	.611
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6. Conclusions

In support of previous studies, the zero order correlations between educational tax rate and income, occupation, and education are all positive in New York State. Surprisingly, the occupational level of the community is more highly related to the tax rate than income, the most commonly used measure used in studies of community attributes affecting educational effort. Income, however, did prove to be the most highly related variable to per pupil expenditure, often considered a quality measure. Income again appeared when assessing the community attribute that was most highly related to property wealth.

One interesting finding is the absence of a strong correlation, either positive or negative, between tax rate and property wealth. This finding differs from previous work, and bears further study and need for independent replications. Perhaps work duplicating Ladd (1976) should be undertaken, separating residential and non-residential property wealth.

Because both expenditure level and tax rate were thought to be influenced by property wealth, obscuring their relationships with community attributes, analyses were run with property wealth controlled. Without property wealth in the equation, occupation was most highly correlated with expenditure level and with tax rate. Since New York is one of a number of states currently collecting data on income by school district [Iowa, Kansas, Maryland, Missouri, Nebraska, Oregon, and Wisconsin are also doing so (Odden, 1978)], and might soon be considering an income correction to their state aid formula, the results suggest that their efforts are misplaced. Occupation not only is more highly correlated with expenditure level and tax rate, once property wealth is controlled, but also might be a better measure to collect because it can be assumed that it would exhibit less instability over time. This would eliminate the necessity of yearly collection of data, an important consideration.

Tax rate was strongly correlated with expenditure level (.62), controlling for property wealth, indicating that in New York State districts the tax rate may

be considered a surrogate for school district "effort." Such a relationship also calls into question the entire Serrano hypothesis that, in the absence of wealth neutrality, tax rates and expenditure levels will be inverse. It also indicates that further studies are in order on the effects of "price" (Feldstein, Ladd) and the Tiebout hypothesis (Oates), questioning the efficiency of district power equalizing to achieve expenditure disparity reduction. It also tends to explain why tax rate equalization (or reduction) in the form of Proposition 13 or DPE plans are so popular. Perhaps most disappointing is the relative impotency of education in assessing the relationships between community variables and expenditure level, tax rate, and property wealth. A priori, it would seem reasonable to assume that education would be excellent correction for the problem of non-residential wealth, being negatively correlated. Unfortunately, the data in this study was unsuitable for such an analysis. Secondly, it seems surprising that the community level of education does not represent "willingness" or "effort" by the community to support levels of local education. Fowler (1977) in a study of the community attributes affecting school schedules, had found level of education the major explanatory variable, and had suggested that this finding meant a desire by residents to obtain for community children the educational level they themselves had attained. Unfortunately, there is no evidence of that effect on expenditures or tax rates.

In summary, without controlling for the effects of property wealth, school district income is the most highly correlated community attribute with per pupil expenditure and educational tax rate. Tax rate and property wealth, however, are not correlated in New York state. Controlling for property wealth, occupation becomes the community attribute most highly correlated with expenditure level and tax rate. Tax rate and expenditure level in New York are correlated highly enough to use tax rate as a measure of a school district's effort.

The finding that occupation is most highly correlated with expenditure level and tax rate calls into question the efficacy of income corrections to state

school finance formulas, and suggests attention to occupational corrections which might prove easier to collect information about, and might be more stable, leading to lower collection costs.

APPENDIX A

Variables Obtained from the
New York State Department of Education

CODE, SCHOOL DISTRICT CODE/
 NAME1, SCHOOL DISTRICT NAME/
 NAME2, SCHOOL DISTRICT NAME/
 NAME3, SCHOOL DISTRICT NAME/
 NAME4, SCHOOL DISTRICT NAME/
 VAR001, EXPENDITURE LEVEL /
 VAR002, TOTAL EXP ALL PURPOSES PER TAPU/
 VAR003, TOTAL PUPIL TRANS EXP PER TAPU/
 VAR004, TOTAL DEBT SERVICE PER TAPU/
 VAR005, ALL OTHER EXP EDUC PER TAPU/
 VAR006, TOTAL EXP INSTR SVCS PER TAPU/
 VAR007, TOTAL EXP INSTR MAT + SUP PER TAPU/
 VAR008, TOTAL EXP TEXTBOOKS PER TAPU/
 VAR009, 1975 EV PER 1975-76 RWADA/
 VAR010, TRUE TAX RATE ALL EDUC PURPS/
 VAR011, TRUE TAX RATE DEBT SVCE/
 VAR012, TRUE TAX RATE FOR TRANSP/
 VAR013, TAX RATE FOR CAPITAL OUTLAY/
 VAR014, TAX RATE FOR ALL OTHER GF PURP/
 VAR015, 1975 FULL VALUE/
 VAR016, TOTAL STATE AID/
 VAR017, TOTAL OPERATING AID/
 VAR018, TOTAL PROF STAFF PER WADA/
 VAR019, CLASSROOM PK-6 PER ADA/
 VAR020, CLASSROOM 7-12 PER ADA/
 VAR021, TOTAL CLASSROOM PER WADA/
 VAR022, OTHER PROF PK-6 PER ADA/
 VAR023, OTHER PROF 7-12 PER ADA/
 VAR024, TOTAL OTHER PROF PER WADA/
 VAR025, AVG SALARIES K-6/
 VAR026, AVG SALARIES 7-12/
 VAR027, SALARY QUANTILES-25TH/
 VAR028, SALARY QUANTILES-50TH/
 VAR029, SALARY QUANTILES-75TH/
 VAR030, NO BACHELOR DEGREE/
 VAR031, BACHELOR DEGREE/
 VAR032, BACHELOR + 30/
 VAR033, MASTERS DEGREE/
 VAR034, MASTERS + 30/
 VAR035, DOCTORATE/
 VAR036, YRS TEACHING IN DISTRICT 25TH QRTL/
 VAR037, YRS TEACHING IN DISTRICT 50 QRTL/
 VAR038, YRS TEACHING IN DISTRICT 75TH QRTL/
 VAR039, TEACHERS AGE QUARTILE -25TH/
 VAR040, TEACHERS AGE QUARTILE -50TH/
 VAR041, TEACHER AGE QUARTILE -75TH/
 VAR042, PEP MEDIAN SCORE MATH 3RD GRD/
 VAR043, PEP MEDIAN SCORE MATH 6TH GRD/
 VAR044, PEP MEDIAN SCORE MATH 9TH GRD/
 VAR045, PEP MEDIAN SCORE RDNG 3RD GRD/
 VAR046, PEP MEDIAN SCORE RDNG 6TH GRD/
 VAR047, PEP MEDIAN SCORE RDNG 9TH GRD/
 VAR048, PEP STD DEVIATION MATH 3RD GRD/
 VAR049, PEP STD DEVIATION MATH 6TH GRD/
 VAR050, PEP STD DEVIATION MATH 9TH GRD/
 VAR051, PEP STD DEVIATION RDNG 3RD GRD/
 VAR052, PEP STD DEVIATION RDNG 6TH GRD/
 VAR053, PEP STD DEVIATION RDNG 9TH GRD/
 VAR054, PEP Z BEL MIN CMP MATH 3RD GRD/
 VAR055, PEP Z BEL MIN CMP MATH 6TH GRD/
 VAR056, PEP Z BEL MIN CMP MATH 9TH GRD/

VAR057, PEP % BEL MIN CMP PDNG 3RD GRD/
VAR058, PEP % BEL MIN CMP PDNG 6TH GRD/
VAR059, PEP % BEL MIN CMP PDNG 9TH GRD/
VAR060, RE ORIGINAL WINNERS/
VAR061, NUMBER TAKING EXAM/
VAR062, AVERAGE DISTRICT SCORE PER WADA/
VAR063, INSTRUCTIONAL SALARIES PER WADA/
VAR064, TOTAL STATE AID PER TAPU/
VAR065, TOTAL OPERATING AID PER TAPU/
VAR066, 1973 FV PER 1973-74 WADA/
VAR067, 1975-76 ENROLLMENT/
VAR068, 1975-76 ADA/
VAR069, 1975-76 TAPU/
VAR070, 1975-76 WADA/
VAR071, 1975-76 WADA/
VAR072, REGIONAL AREA CODE/
ED, MEDIAN EDUCATION OF SCHOOL DISTRICT/
INC, MEDIAN INCOME OF SCHOOL DISTRICT/
OCC, MEDIAN OCCUPATION OF SCHOOL DISTRICT/
TSES, TOTAL SES OF SCHOOL DISTRICT/

APPENDIX B

Scattergrams of Zero-Order Correlations

Figures 1-11

28

SCATTERGRAM (CREATION DATE = 07/16/79) OF EXPEND. AND TAX RATE VARIABLES WITH ED. OCC. INC
(DOWN) LNEXPLV (ACROSS) OCC MEDIAN OCCUPATION OF SCHOOL DIST
52.1125 56.3975 60.6825 64.9675 69.2525 73.5375 77.8225 82.1075 86.3925 90.6775

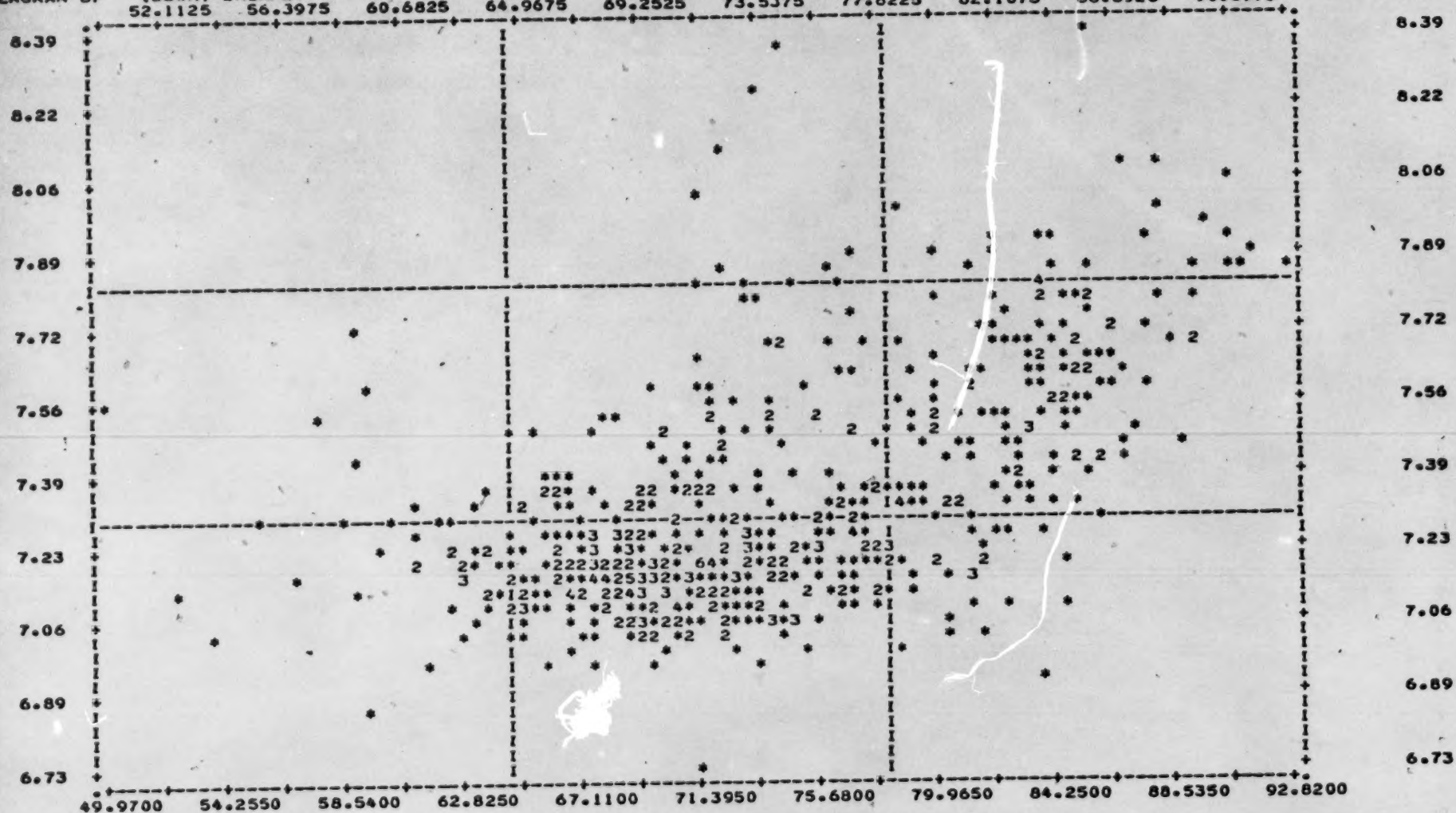


Figure 2

SCATTERG (CREATION DATE = 07/16/79) OF EXPEND. AND TAX RATE VARIABLES WITH ED. OCC. INC
 TERGHAM OF (DOWN) LNEXPLV (ACROSS) INC MEDIAN INCOME OF SCHOOL DISTRICT
 36.7915 40.0545 43.3175 46.5805 49.8435 53.1065 56.3695 59.6325 62.8955 66.1585

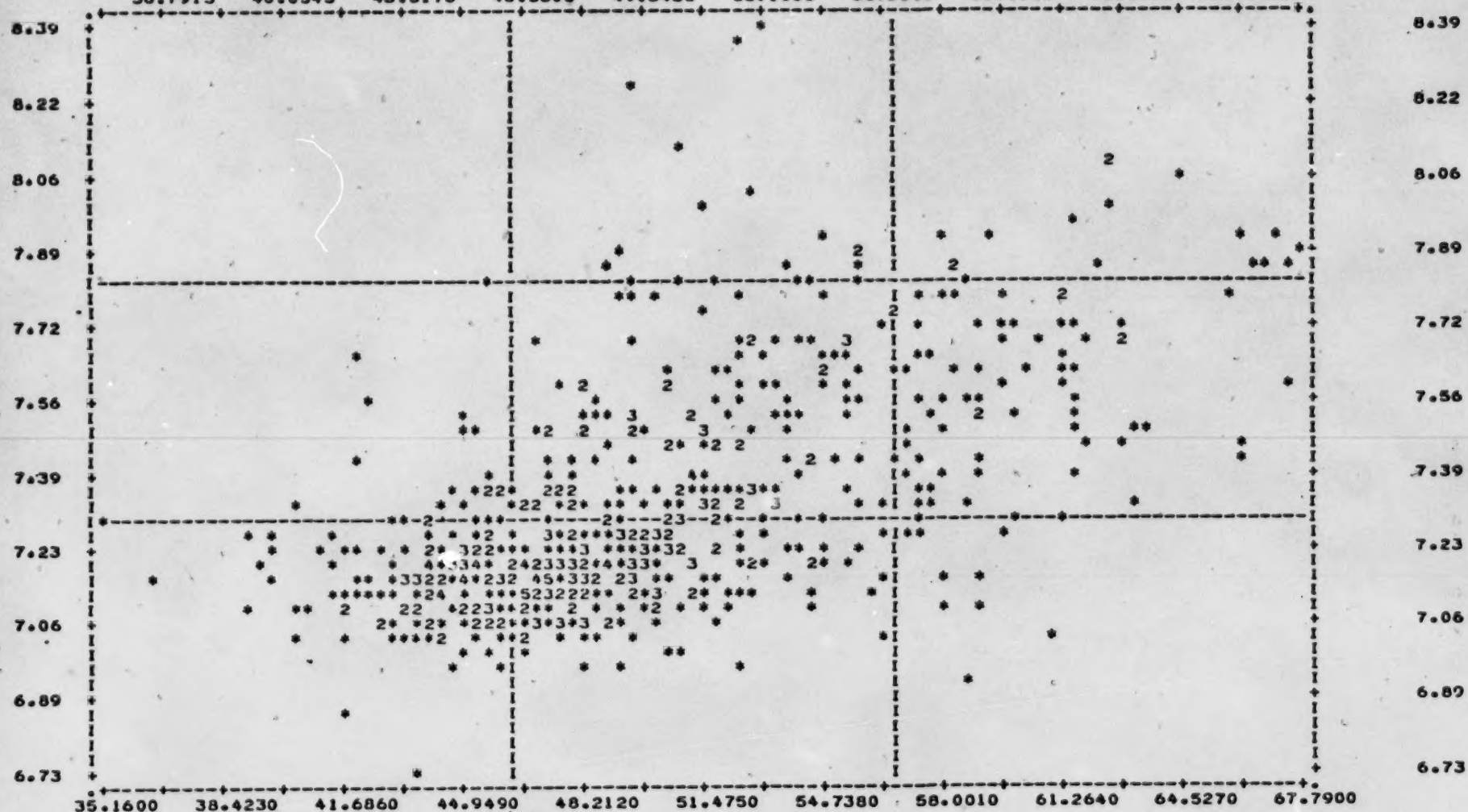


Figure 3

E SCATTERG (CREATION DATE = 08/10/79) OF FV.LNEXPLV,INC
 TTERGRAM OF (DOWN) LNEXPLV

(ACROSS) VAK010 TRUE TAX RATE ALL EDUC PUMPS
 21.74 24.52 27.29 30.07 32.85

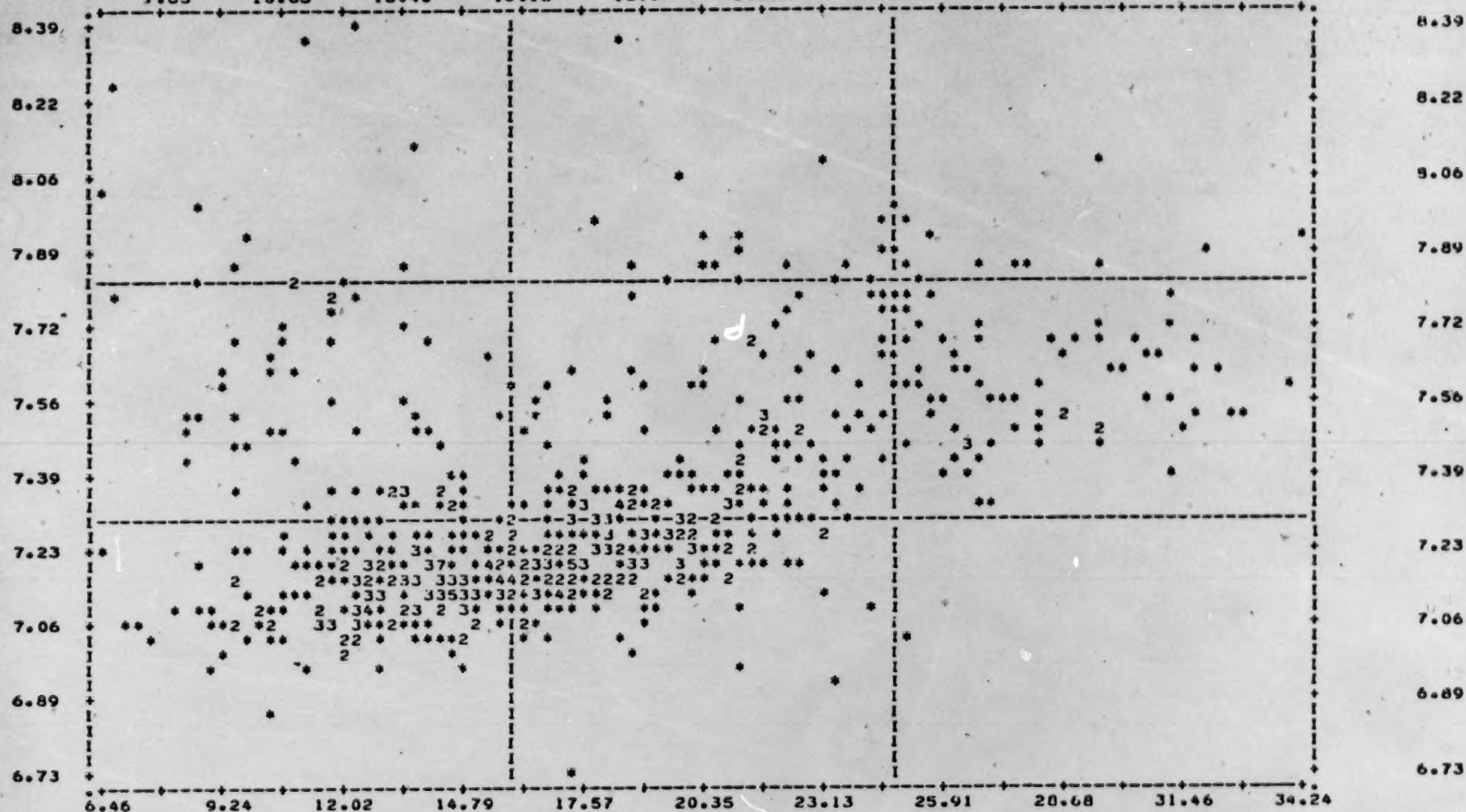


Figure 4

FILE SCATTERG (CREATION DATE = 08/10/79) OF FV.LNEXPLV,INC
 CATTERGRAM OF (DOWN) LNV009

(ACROSS) ED

MEDIAN EDUCATION OF SCHOOL DIST

36.0915 40.7745 45.4575 50.1405 54.8235 59.5065 64.1895 68.8725 73.5555 78.2385

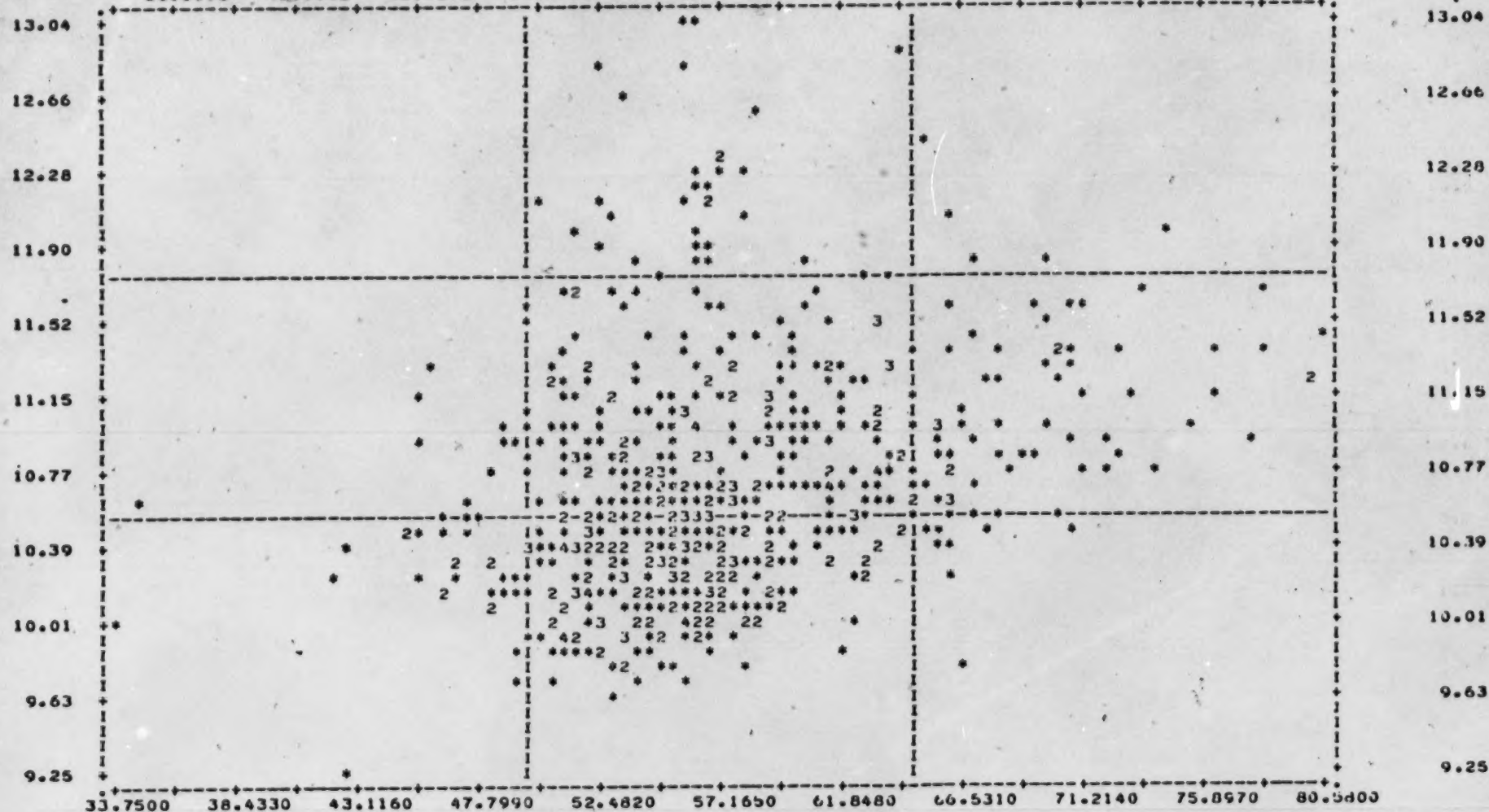


Figure 5

ANALYSIS OF SUNY DATA TAPE

08/10/79

PAGE 8

FILE SCATTERG (CREATION DATE = 08/10/79) OF FV.LNEXPLV.INC
SCATTERGRAM OF (DOWN) LNV009

(ACROSS) OCC

MEDIAN OCCUPATION OF SCHOOL DIST

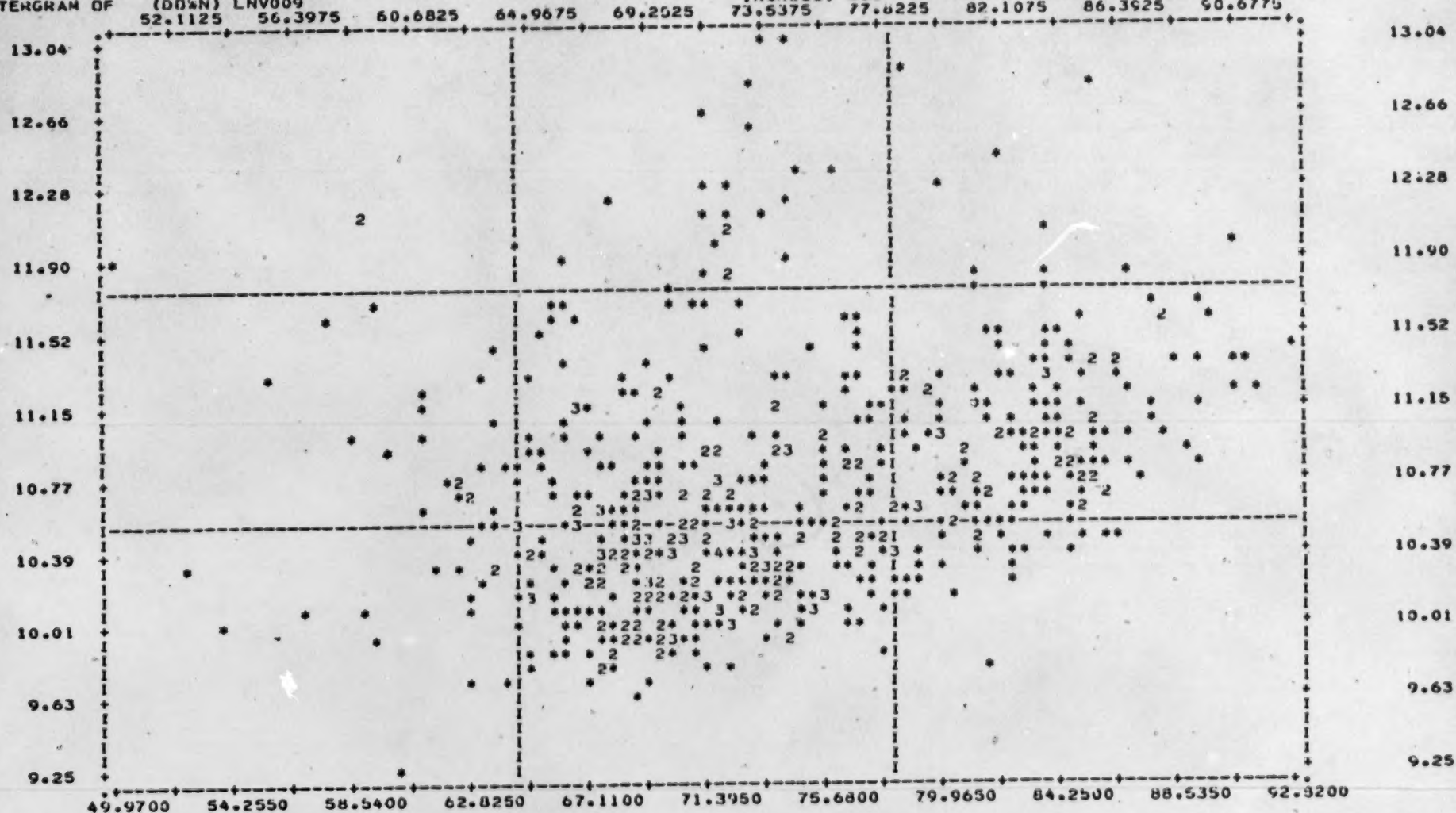


Figure 6

FILE SCATTERG (CREATION DATE = 08/10/79) IN IV.LNEXP.LV. INC

CATTENHAM OF (DOWN) LNVOO9

(ACROSS) INC

MEDIAN INCOME OF SCHOOL DISTRICT

36.7915 40.0545 43.3175 46.5005 49.9435 53.1065 56.7695 59.6325 62.8955 66.1585

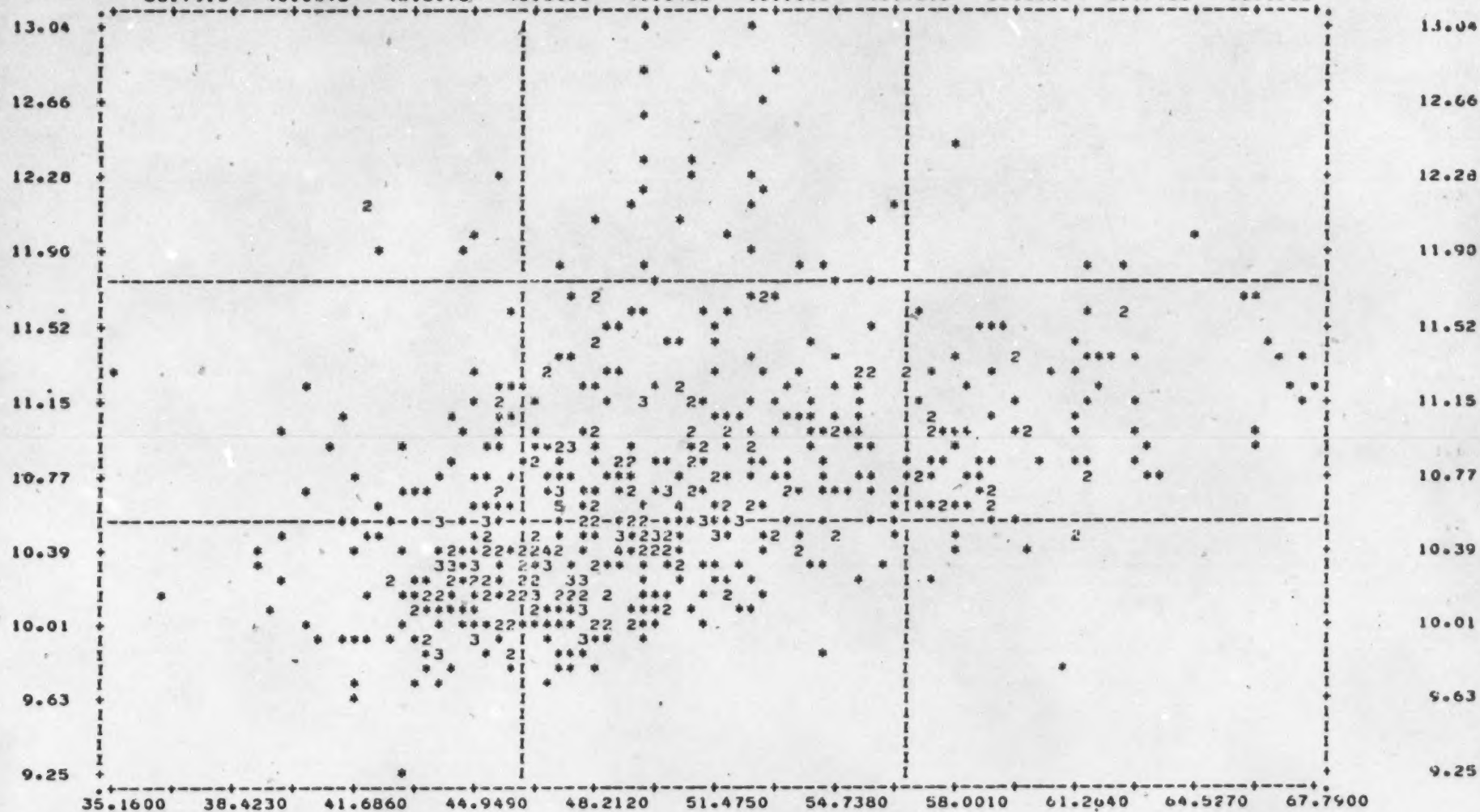


Figure 7

ANALYSIS OF SUNY DATA TAPE

08/10/79

PAGE 12

SCATTERG (CREATION DATE = 08/10/79) OF FV.LNEXPLV,INC
 ATTERGRAM OF (DOWN) LNV009

(ACROSS) VAR010 TRUE TAX RATE ALL CDDC PUMPS
 21.74 24.52 27.29 30.37 32.45

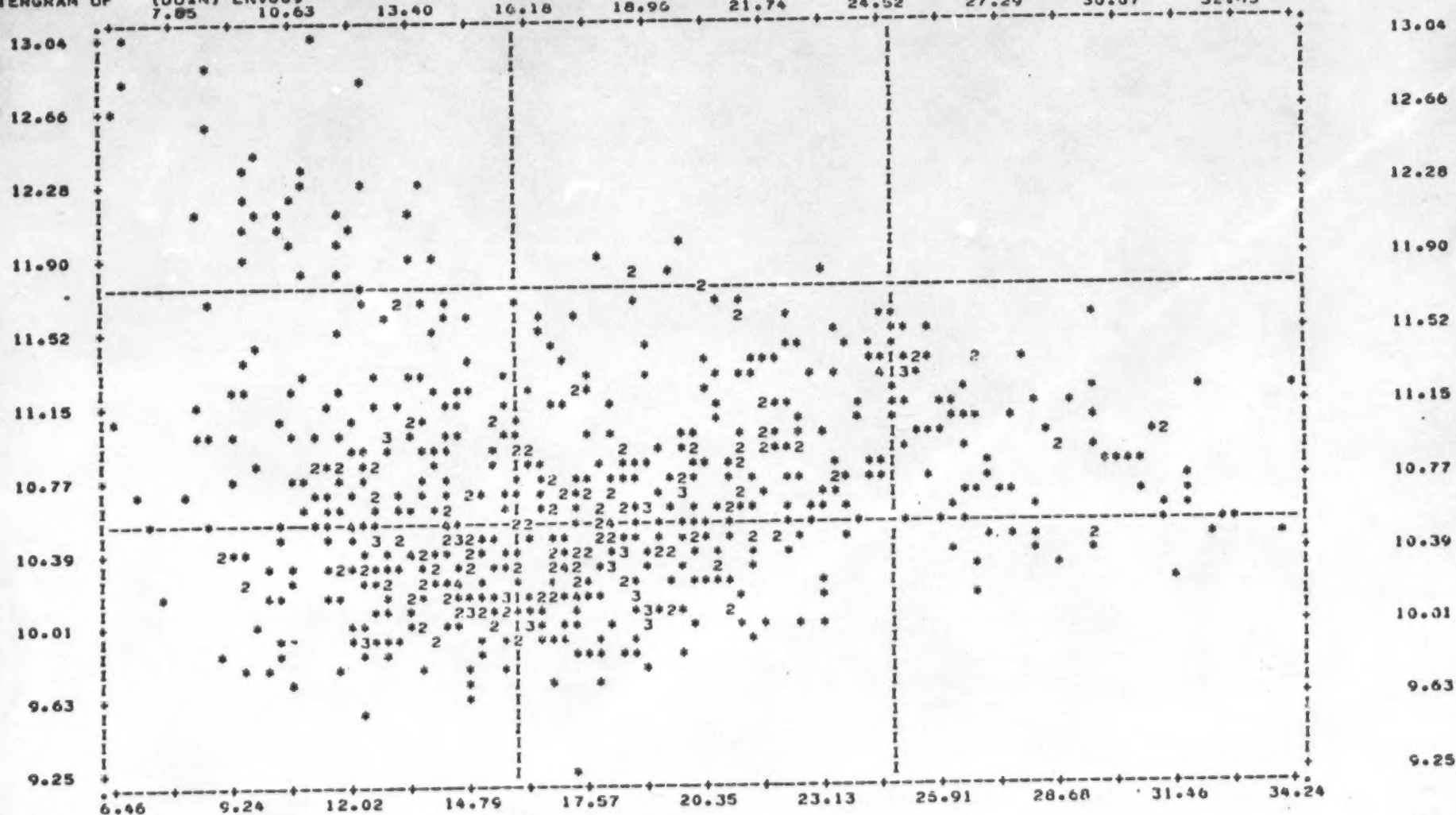


Figure 8

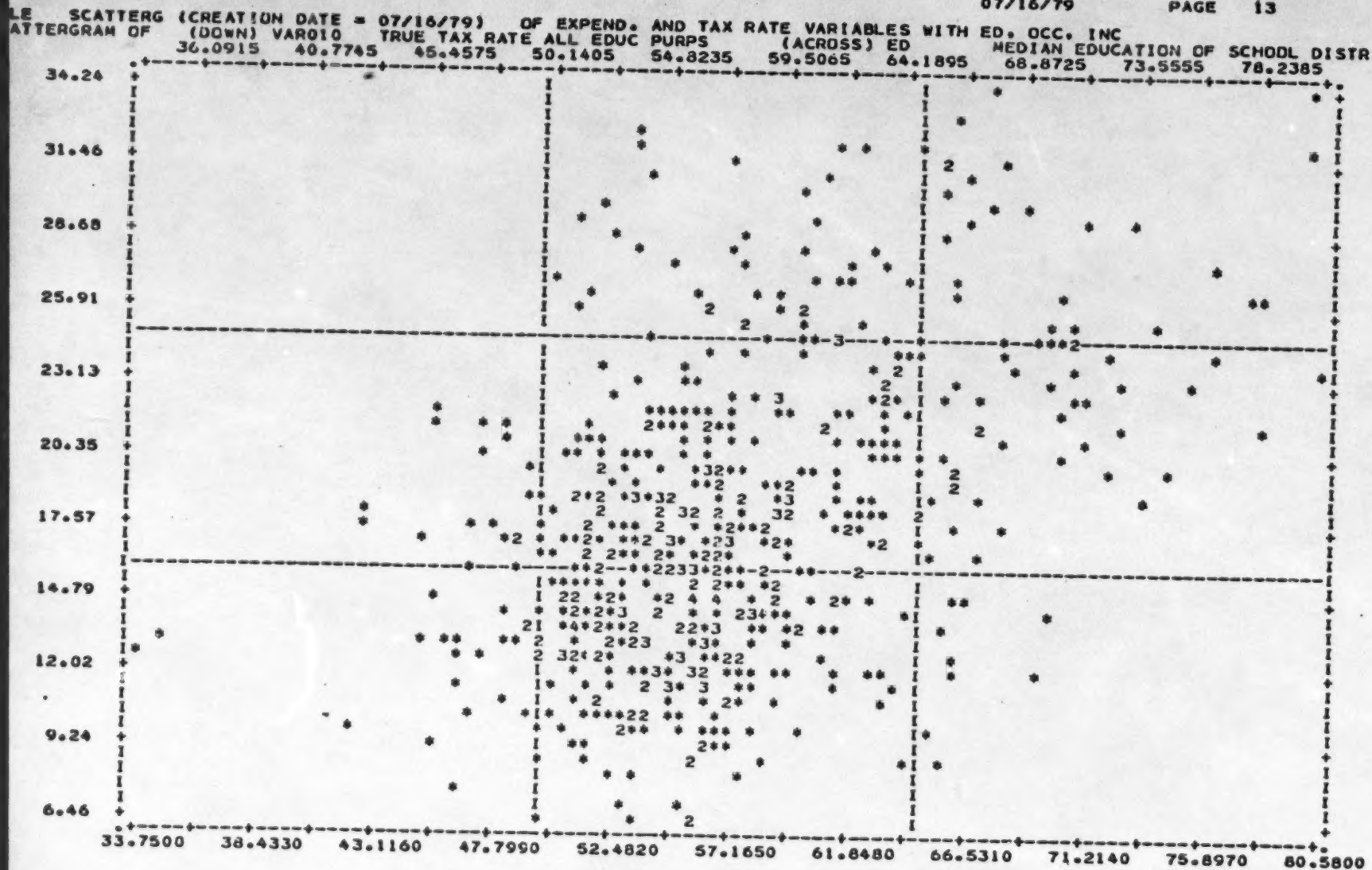


Figure 9

SCATTERG (CREATION DATE = 07/16/79) OF EXPEND. AND TAX RATE VARIABLES WITH ED. OCC. INC
 (DOWN) VAR310 TRUE TAX RATE ALL EDUC PURPS (ACROSS) OCC MEDIAN OCCUPATION OF SCHOOL DIST
 52.1125 56.3975 60.6825 64.9675 69.2525 73.5375 77.8225 82.1075 86.3925 90.6775

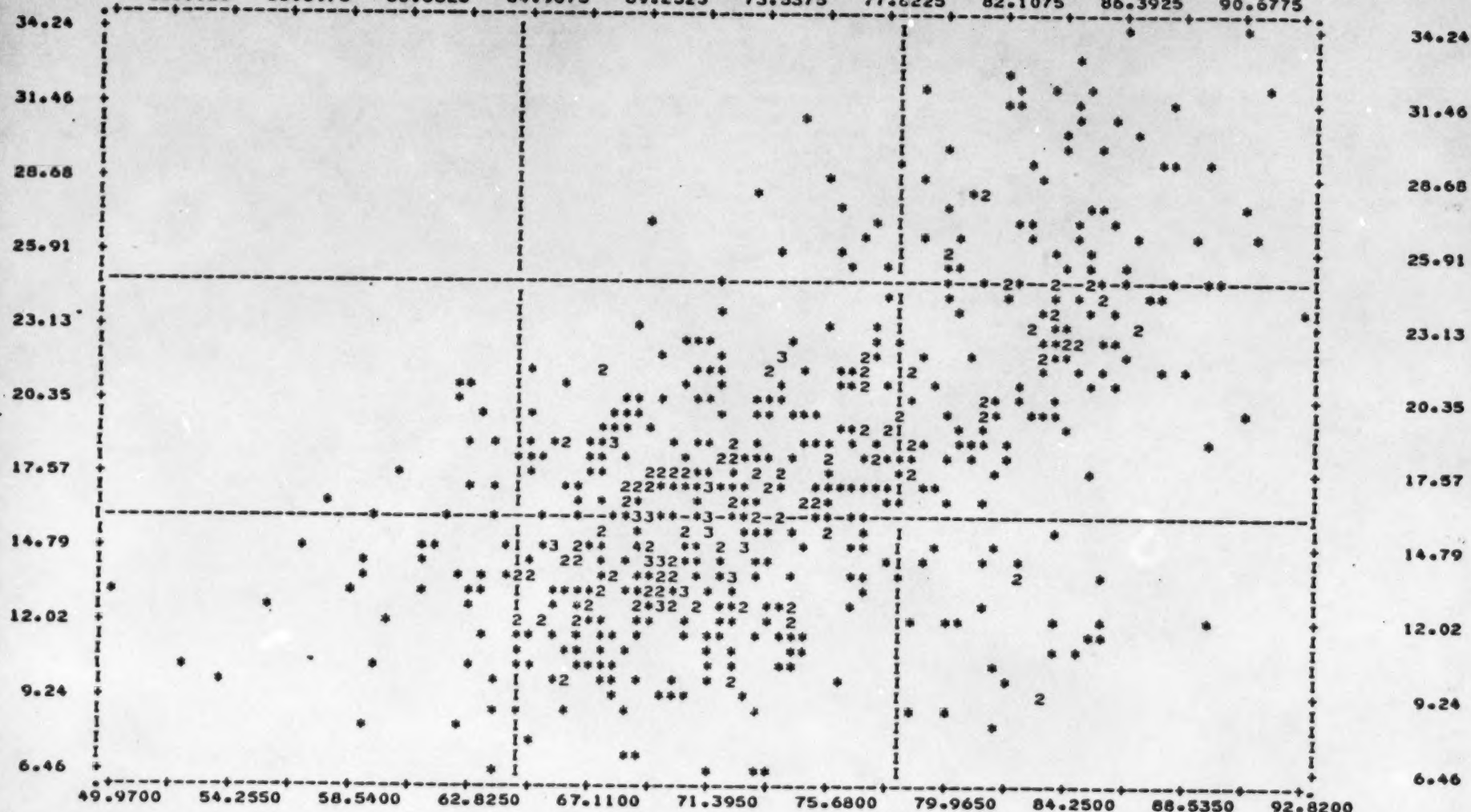


Figure 10

FILE SCATTERG (CREATION DATE = 07/16/79) OF EXPEND. AND TAX RATE VARIABLES WITH ED. OCC. INC
SCATTERGRAM OF (DOWN) VAR010 TRUE TAX RATE ALL EDUC PURPS (ACROSS) INC MEDIAN INCOME OF SCHOOL DISTRICT
36.7915 40.0545 43.3175 46.5805 49.8435 53.1065 56.3695 59.6325 62.8955 66.1585

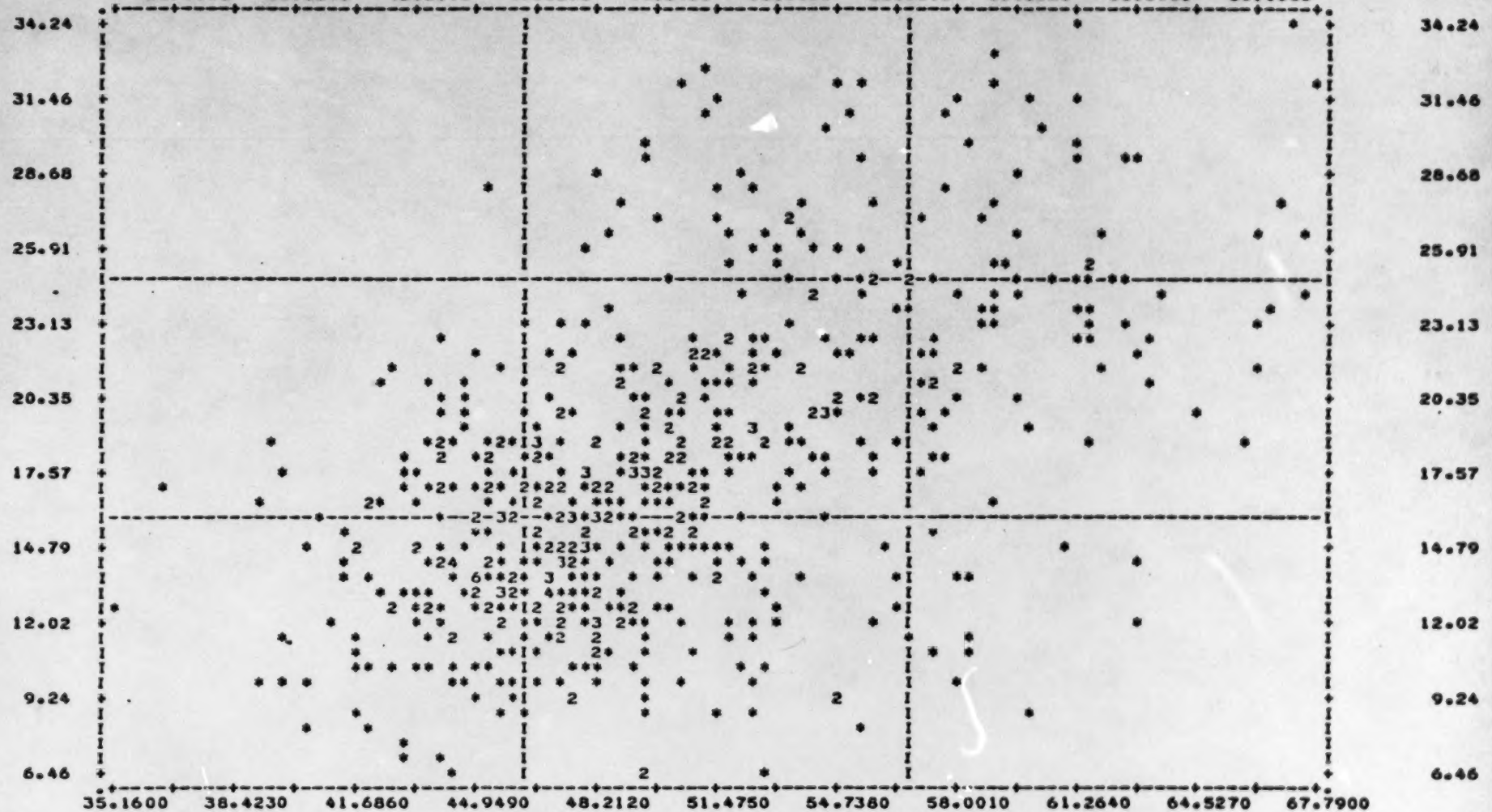


Figure 11

APPENDIX C

Scattergrams of Correlations
with Property Wealth Controlled

Figures 12-18

FILE SCATTERING (CREATION DATE = 08/07/79) OF RESIDUAL OF LNEXPLV.VAR010
 SCATTERGRAM OF (DOWN) RESV001 (ACROSS) ED MEDIAN EDUCATION OF SCHOOL DISTR

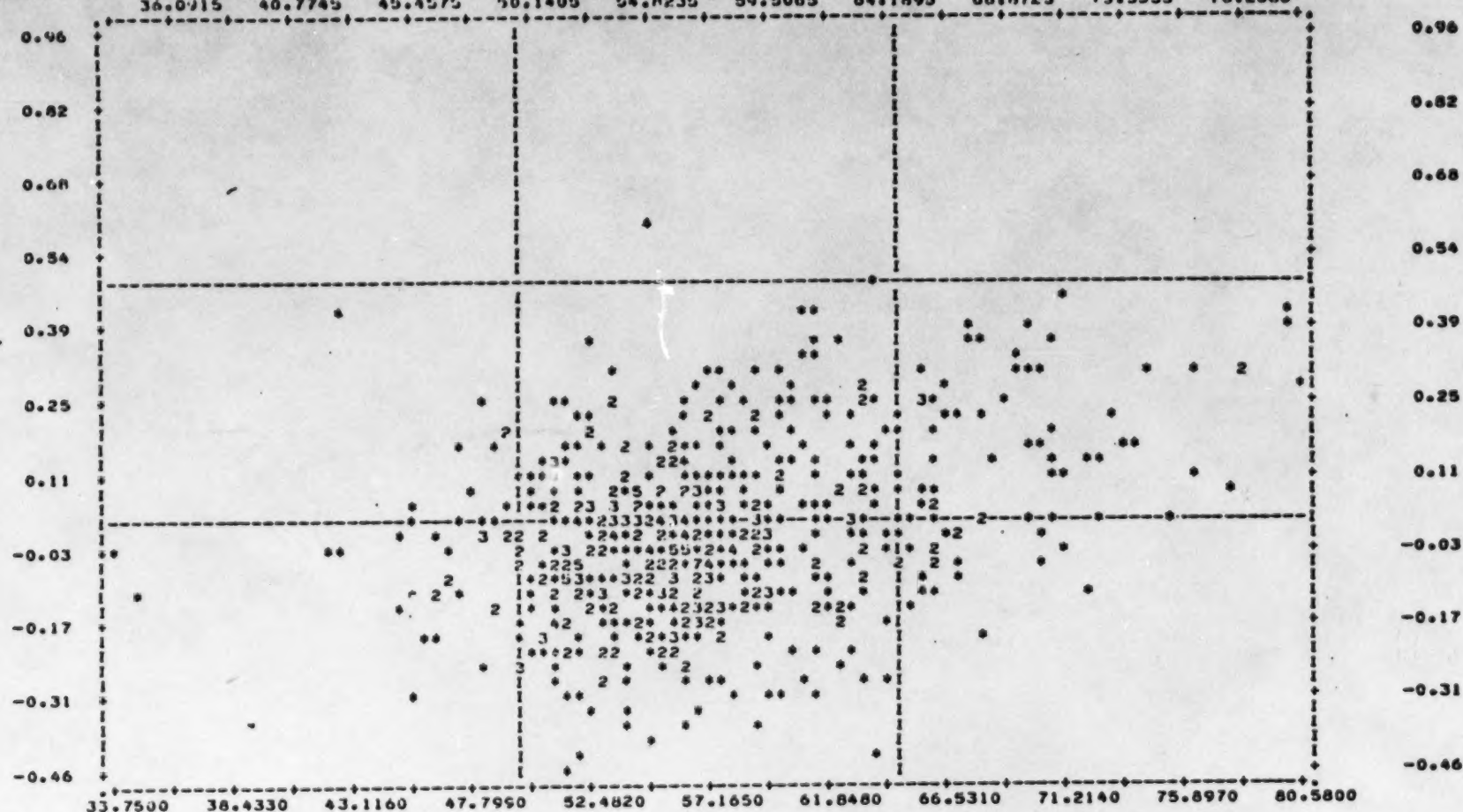


Figure 12

FILE SCATTING (CREATION DATE = 08/07/79) OF RESIDUAL OF LNEPLV.VAR010
 SCATTINGHAM OF (DIAM) HLSV001 (ACH055) INC MEDIAN INCOME OF SCHOOL DISTRICT
 30.7915 40.9545 43.3175 46.5805 49.8435 53.1065 56.3695 59.6325 62.8955 66.1585

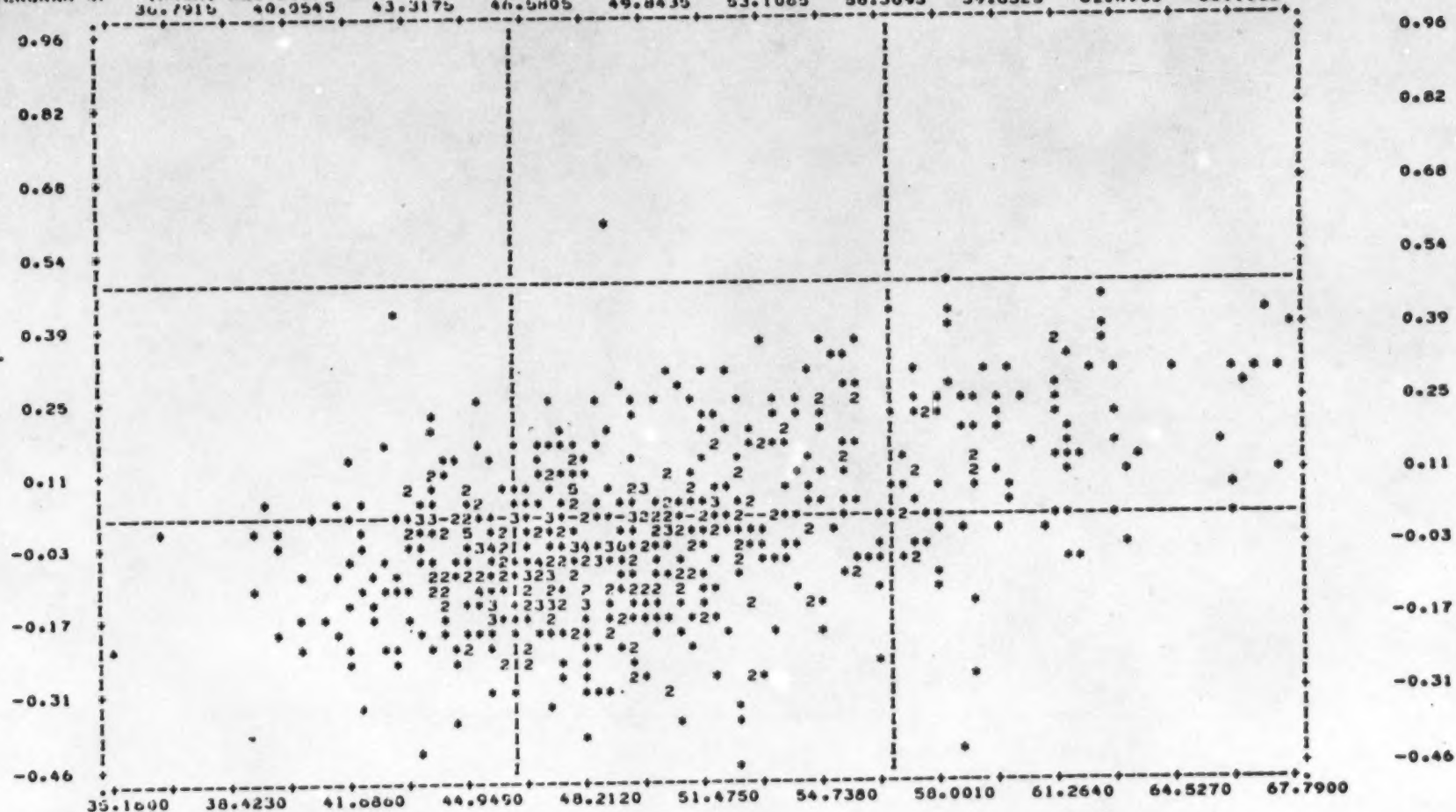


Figure 13

FILE SCATTERING (CORRELATION DATE = 08/07/79) OF RESIDUAL OF LNCAPLV,VAR010
 SCATTERGRAM OF (JUNN) RESV001 (ACROSS) OCC MEDIAN OCCUPATION OF SCHOOL DIST

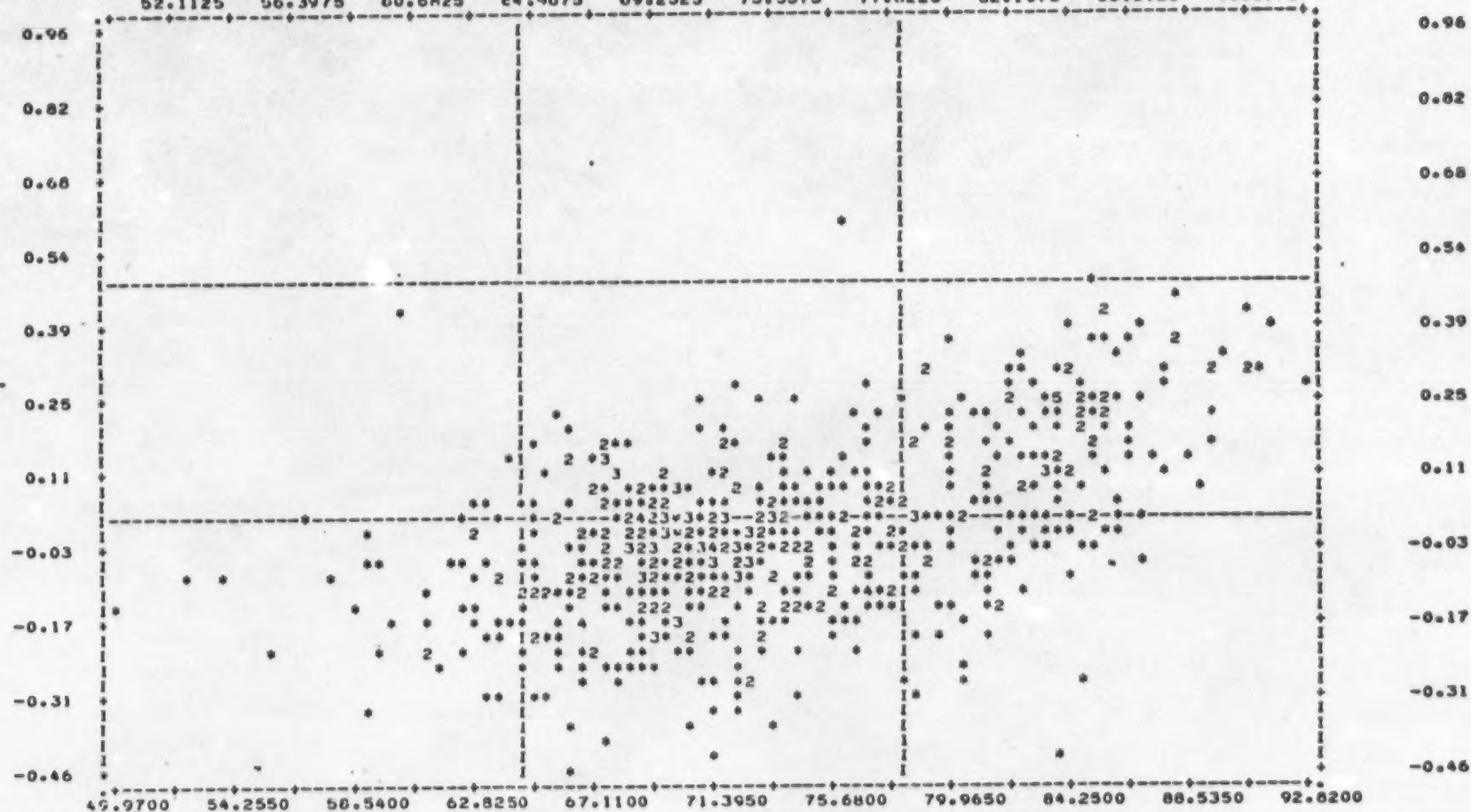


Figure 14

FILE SCATTERG (CREATION DATE = 08/07/79) OF RESIDUAL OF LNEXPV,VAR010
 SCATTERGRAM UP (DOWN) HESV010 (ACROSS) INC
 36.7915 40.0545 43.3175 46.5805 49.8435 53.1065 56.3695 59.6325 62.8955 66.1585

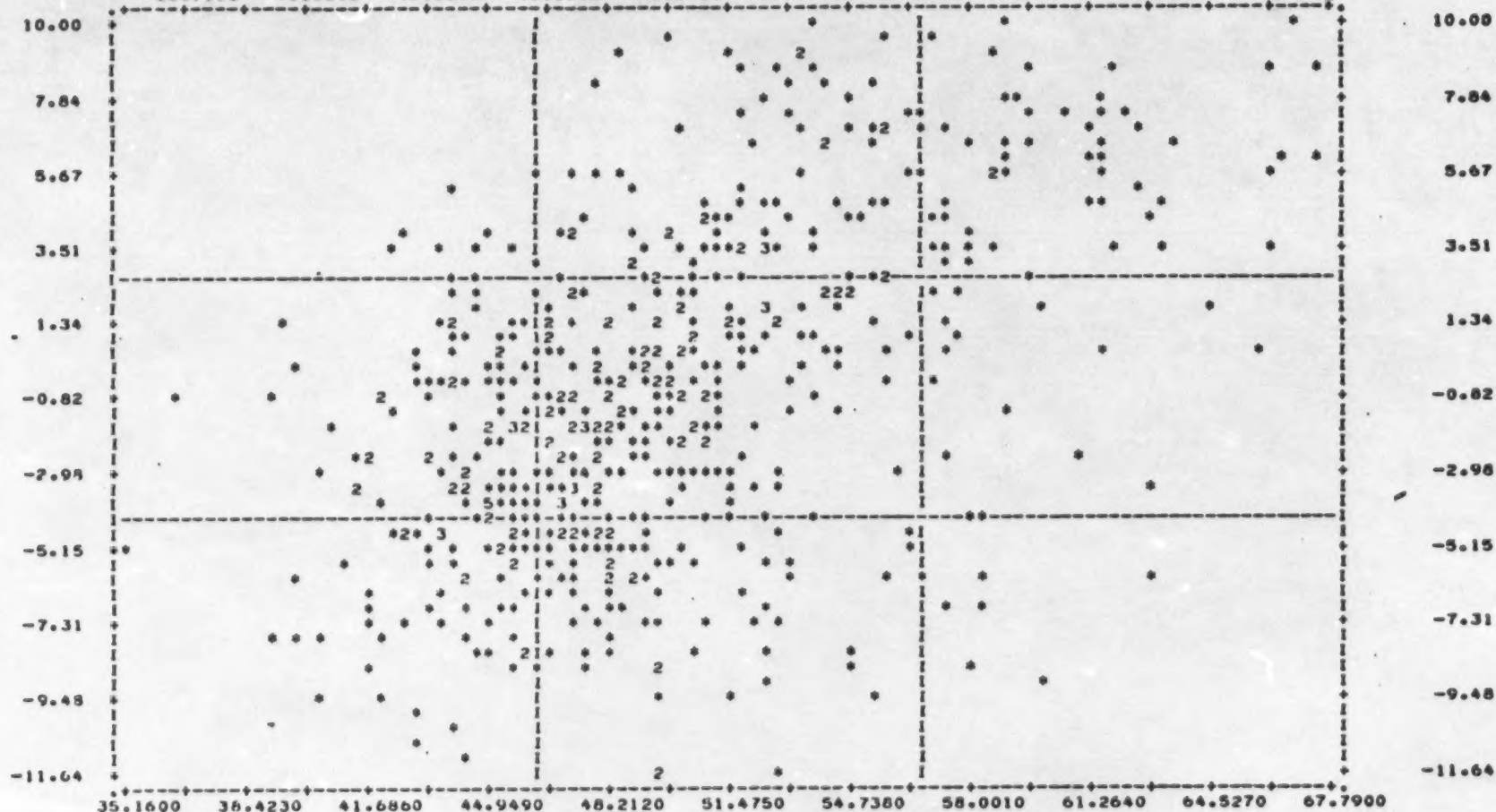


Figure 15

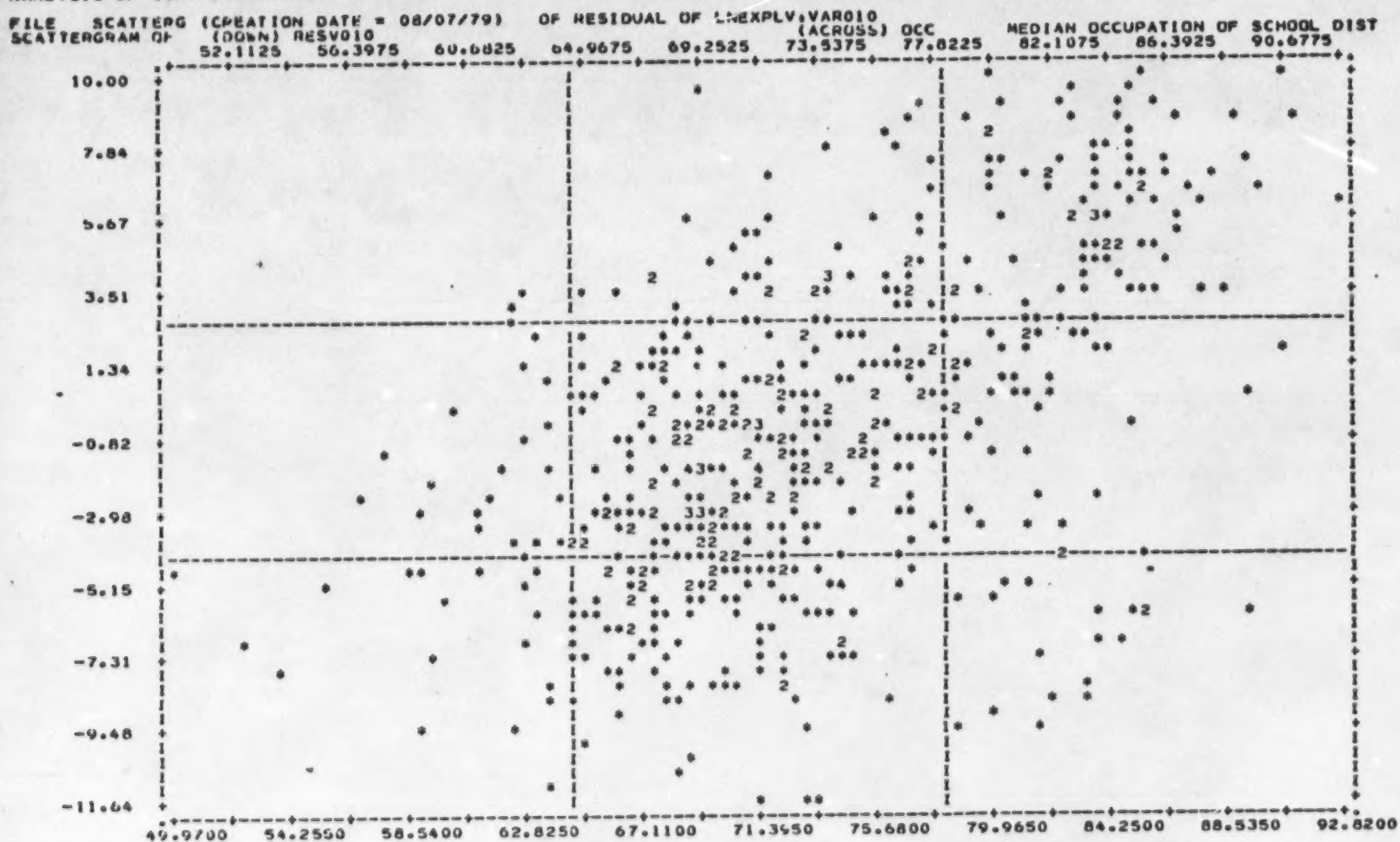
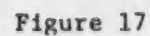


Figure 16



FILE SCATTERS (CREATION DATE = 08/07/79) OF RESIDUAL OF LNEPLV,VAR010
 SCATTERGRAM OF (DOWN) NL5V010 (ACROSS) ESTV010

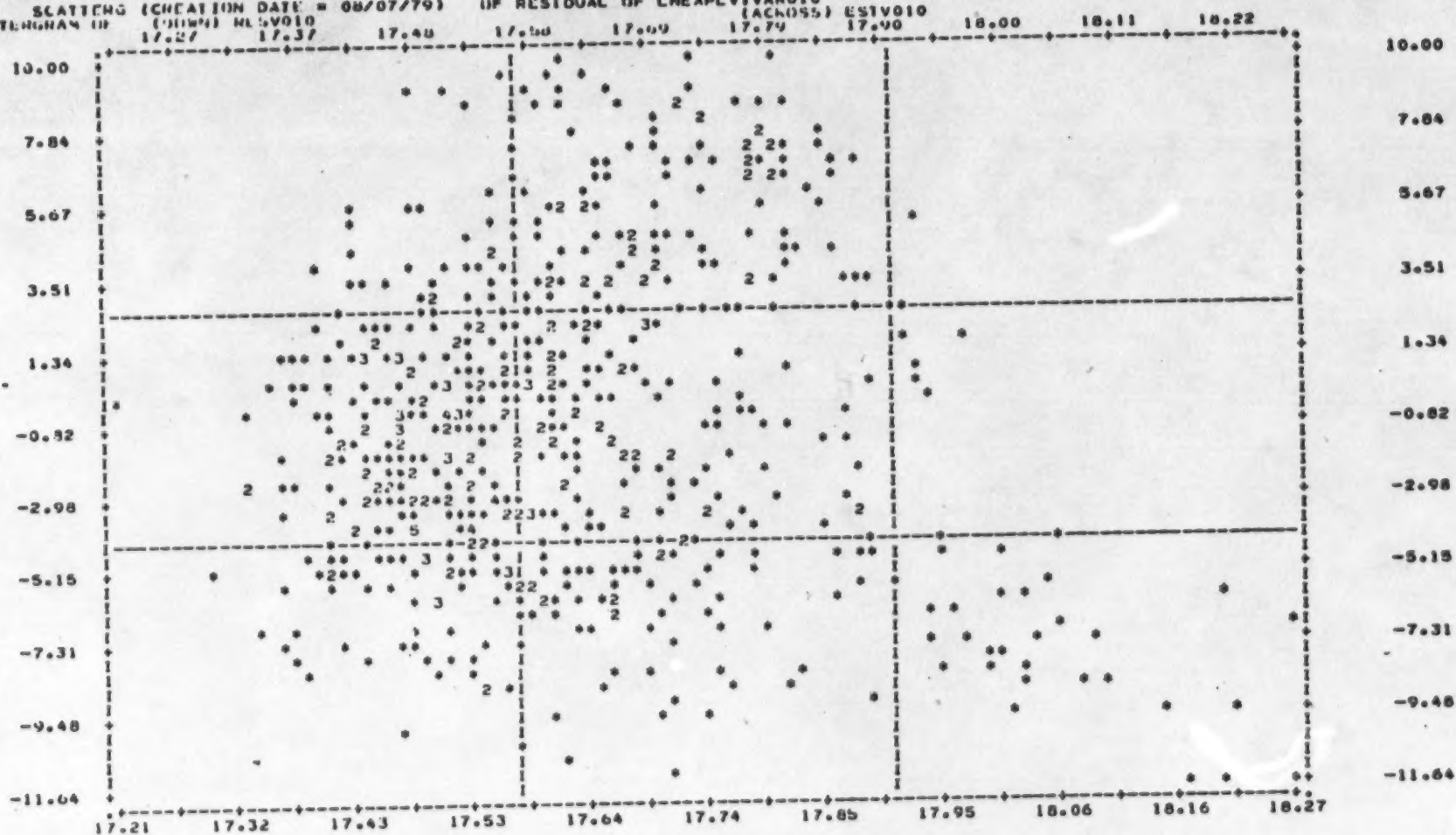


Figure 18

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